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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/070,973	06/25/2002	Thorsten Pannek	10191/2253	4773
26646	7590	04/08/2004	EXAMINER	
KENYON & KENYON ONE BROADWAY NEW YORK, NY 10004			JAGAN, MIRELLYS	
			ART UNIT	PAPER NUMBER
			2859	

DATE MAILED: 04/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/070,973	PANNEK ET AL.	
	Examiner	Art Unit	
	Mirellys Jagan	2859	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 December 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 13-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 March 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                         |                                                                             |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                                |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____                                                             | 6) <input type="checkbox"/> Other: _____                                    |

### **DETAILED ACTION**

1. Applicant's arguments, filed 12/23/04, with respect to the rejections of claims 13-20 under 35 U.S.C. 102(b), and claims 21-26 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Higashi et al, Beerwerth et al, VanGerwen et al, and the prior art disclosed by applicant.

#### ***Drawings***

2. The proposed corrections to the drawings that were filed 12/23/03 have been approved since they overcome the objections to the drawings in the last Office action. However, the drawings are further objected to as follows:

The drawings are objected under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the thermosensor including an IR sensor, as claimed in claims 14 and 24; and the conductor and reference circuit trace, as claimed in claim 18 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

#### ***Specification***

3. The disclosure is objected to because of the following informalities:

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It is not clear in the specification how one thermocouple can have two junctions. The specification states that figure 1 shows “a single thermocouple” (see page 5, lines 25-28 and page 6, lines 13-14), but then states that the single thermocouple has two junctions (see page 22-24), a junction at T2, and a second thermocouple having a junction at T1. In this case, figure 1 shows two thermocouples, one having a junction at T2, and the other having a junction at T1.

Appropriate correction is required.

### *Claim Objections*

4. Claims 14, 18, 22, and 24 are objected to because of the following informalities:

In claims 14 and 24, there is lack of antecedent basis in the specification for the thermosensor, i.e., the thermosensor shown in figure 1, including an IR sensor. The specification discloses that pluralities of thermosensors are combined to form an IR sensor. Therefore, claims 14 and 24 are not clear since they appear to state that an individual thermosensor has an IR sensor.

In claim 16, it is not clear in the claim of the specification how one thermocouple can have multiple junctions. The specification discloses in figure 1 two thermocouples, one thermocouple having a junction at T2, and a second thermocouple having a junction at T1.

In claim 18, line 2 should be corrected for typographical errors, i.e., duplicate terms. Furthermore, there is lack of antecedent basis in the claim for a “conductor” in line 3.

Claim 22 should be corrected for typographical errors, e.g., “the one of the part” in lines 1-2. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 13-22 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 13 and 25, the term "-type" renders the claim indefinite because it has been held that, when appended to otherwise definite expression, the term "type" so extends scope of expression as to render it objectionably indefinite. See *Ex parte Copenhaver*, 109 USPQ 118 (Bd. App. 1955).

Claims 14-22 are rejected for being dependent on rejected base claim 13.

7. Claims 18 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01.

In claim 18, the omitted structural cooperative relationship is between the 'conductor', the "reference circuit trace' and the remaining elements of the claim.

Claim 22 is rejected for being dependent on rejected base claim 18.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

9. Claims 13-15 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,220,189 to Higashi et al [hereinafter Higashi].

Higashi discloses a sensor for measuring IR radiation, the sensor comprising:

a supporting body; and

a plurality of thermocouples located on the body, each of the thermocouples including a first material (45) and a second material (46) forming in a point-wise manner at least one thermal junction (47) with each other, wherein at least one of the first and second materials are configured in a meander-shape circuit trace, i.e., a U-shaped, arranged on the body;

wherein the first and the second materials extend substantially side-by-side, and are insulated from one another by the body except for at their junction, and can be made of a metal with a semiconductor material (see figure 3).

10. Claims 13-16, 19, and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,203,194 to Beerwerth et al [hereinafter Beerwerth].

Beerwerth discloses a sensor for measuring IR radiation, the sensor comprising:

a supporting body (3);

a 'thermocouple' located on the body, the thermocouple including a first material and a second material forming in a point-wise manner at least one thermal contact (11) with each other; wherein:

at least one of the first and second materials are configured in a meander-shape circuit trace arranged on the body;

the 'thermocouple' includes a plurality of thermal contacts (11, 12) configured as a thermal chain such that at least two of the contacts are exposed to different temperatures, and an additional measuring device (4) is present to detect temperatures;

the first and the second materials extend substantially side-by-side, and are insulated from one another by the body except for at their contact; and

the first and second materials are made of a metal with a semiconductor material, i.e., aluminum with polysilicon (see figures 1 and 3; column 3, lines 34-51; column 4, lines 17-21).

### ***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higashi in view of the publication titled "Thin-film boron-doped polycrystalline silicon<sub>70%</sub>-germanium<sub>30%</sub> for thermopiles" by VanGerwen et al [hereinafter VanGerwen] and the Prior Art disclosed by applicant on page 2, lines 13-21 of the specification [hereinafter Prior Art].

Higashi discloses a sensor having all of the limitations of claims 20 and 21, as stated above in paragraph 9, except for the first material including one of doped and undoped polysilicon-germanium, and the second material including platinum.

VanGerwen discloses a radiation sensor (thermopile) comprising a plurality of thermocouples, each thermocouple made of a first and a second material forming a junction. The first material is made from polysilicon-germanium, and the second material is made of a thermally conductive metal, such as aluminum. VanGerwen teaches that using the polysilicon-germanium with a metal to form the thermocouples of a radiation sensor is beneficial since it allows the radiation sensor to be CMOS compatible.

The Prior Art discloses that it is known to use platinum as a conductive metal material in combination with a semiconductor material to make a thermocouple for a radiation sensor.

Referring to claim 20, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the sensor disclosed by Higashi by replacing the semiconductor material with a polysilicon-germanium material, as taught by VanGerwen, in order to allow the radiation sensor to be CMOS compatible.



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Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the sensor disclosed by Higashi by replacing the metal material with a platinum material, since it is known in the Prior Art that platinum is a useful thermally conductive material for making a thermocouple to be used in a radiation sensor.

13. Claims 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higashi in view of VanGerwen and the Prior Art.

Higashi discloses a sensor for measuring IR radiation, the sensor comprising:

a supporting body; and

a plurality of thermocouples located on the body, each of the thermocouples including a first material (45) and a second material (46) forming in a point-wise manner at least one thermal junction (47) with each other, wherein at least one of the first and second materials are configured in a meander-shape circuit trace, i.e., a U-shaped, arranged on the body;

wherein the first and the second materials extend substantially side-by-side, and are insulated from one another by the body except for at their junction, and can be made of a metal with a semiconductor material (see figure 3).

Higashi does not disclose the first material including one of doped and undoped polysilicon-germanium, and the second material including platinum.

VanGerwen discloses a radiation sensor (thermopile) comprising a plurality of thermocouples, each thermocouple made of a first and a second material forming a junction. The first material is made from polysilicon-germanium, and the second material is made of a thermally conductive metal, such as aluminum. VanGerwen teaches that using the polysilicon-

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germanium with a metal to form the thermocouples of a radiation sensor is beneficial since it allows the radiation sensor to be CMOS compatible.

The Prior Art discloses that it is known to use platinum as a conductive metal material in combination with a semiconductor material to make a thermocouple for a radiation sensor.

Referring to claim 23, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the sensor disclosed by Higashi by replacing the semiconductor material with a polysilicon-germanium material, as taught by VanGerwen, in order to allow the radiation sensor to be CMOS compatible.

Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the sensor disclosed by Higashi by replacing the metal material with a platinum material, since it is known in the Prior Art that platinum is a useful thermally conductive material for making a thermocouple to be used in a radiation sensor.

14. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beerwerth in view of VanGerwen and of the Prior Art.

Beerwerth discloses a sensor having all of the limitations of claim 21, as stated above in paragraph 10, except for the first material including one of doped and undoped polysilicon-germanium, and the second material including platinum.

VanGerwen discloses a radiation sensor (thermopile) comprising a plurality of thermocouples, each thermocouple made of a first and a second material forming a junction. The first material is made from polysilicon-germanium, and the second material is made of a thermally conductive metal, such as aluminum. VanGerwen teaches that using the polysilicon-

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germanium with a metal to form the thermocouples of a radiation sensor is beneficial since it allows the radiation sensor to be CMOS compatible.

The Prior Art discloses that it is known to use platinum as a conductive metal material in combination with a semiconductor material to make a thermocouple for a radiation sensor.

Referring to claim 21, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the sensor disclosed by Beerwerth by replacing the semiconductor material with a polysilicon-germanium material, as taught by VanGerwen, in order to allow the radiation sensor to be CMOS compatible.

Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the sensor disclosed by Beerwerth by replacing the metal material with a platinum material, since it is known in the Prior Art that platinum is a useful thermally conductive material for making a thermocouple to be used in a radiation sensor.

15. Claims 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beerwerth in view of VanGerwen and the Prior Art.

Beerwerth discloses a sensor for measuring IR radiation, the sensor comprising:

a supporting body (3);

a 'thermocouple' located on the body, the thermocouple including a first material and a second material forming in a point-wise manner at least one thermal contact (11) with each other; wherein:

at least one of the first and second materials are configured in a meander-shape circuit trace arranged on the body;

the 'thermocouple' includes a plurality of thermal contacts (11, 12) configured as a thermal chain such that at least two of the contacts are exposed to different temperatures, and an additional measuring device (4) is present to detect temperatures;

the first and the second materials extend substantially side-by-side, and are insulated from one another by the body except for at their contact; and

the first and second materials are made of a metal with a semiconductor material, i.e., aluminum with polysilicon (see figures 1 and 3; column 3, lines 34-51; column 4, lines 17-21).

Beerwerth does not disclose the first material including one of doped and undoped polysilicon-germanium, and the second material including platinum.

VanGerwen discloses a radiation sensor (thermopile) comprising a plurality of thermocouples, each thermocouple made of a first and a second material forming a junction. The first material is made from polysilicon-germanium, and the second material is made of a thermally conductive metal, such as aluminum. VanGerwen teaches that using the polysilicon-germanium with a metal to form the thermocouples of a radiation sensor is beneficial since it allows the radiation sensor to be CMOS compatible.

The Prior Art discloses that it is known to use platinum as a conductive metal material in combination with a semiconductor material to make a thermocouple for a radiation sensor.

Referring to claim 23, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the sensor disclosed by Beerwerth by replacing the semiconductor material with a polysilicon-germanium material, as taught by VanGerwen, in order to allow the radiation sensor to be CMOS compatible.

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Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the sensor disclosed by Beerwerth by replacing the metal material with a platinum material, since it is known in the Prior Art that platinum is a useful thermally conductive material for making a thermocouple to be used in a radiation sensor.

***Allowable Subject Matter***

16. Claims 17, 18, and 22 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, and the objections set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

17. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record does not disclose or suggest the following in combination with the remaining limitations of the claims:

A micropatterned thermosensor comprising a thermocouple having a plurality of contacts configured as a thermal chain or column, wherein one of the contacts is kept at either a constant or substantially constant temperature, a second of the contacts is exposed to a second temperature that is to be detected or measured, and the thermosensor further includes an additional measuring device configured to detect the first temperature (see dependent claim 17).

***Response to Arguments***

18. Applicant's arguments with respect to claims 1-26 have been considered but are moot in view of the new ground(s) of rejection.

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***Conclusion***

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mirellys Jagan whose telephone number is 571-272-2247. The examiner can normally be reached on Monday-Thursday from 8AM to 4PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on 571-272-2245. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MJ  
April 6, 2004



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